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Influence of Gravitational Unloading on Titin's Structure in the Rat Hind Limb Muscles

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Abstract

The influences of microgravity lead to development of the muscular atrophy and reduction of the volume of muscle fibers, both slow and fast types, changes of the muscles structure, decrease in a muscular tone, and also endurance and general muscles functionality. This study was designed to investigate the changes of the titin's structure in m. soleus and m. extensor digitorum longus in rat after 7 days of gravitational unloading. Electrophysiological and immunological analysis of both muscles was performed after the rats were maintained in antiortostatic position for 7 days. Results suggest that 7 days of gravitational unloading decrease the titin's intact N2A-isoform and increase titin's T2 fragment in m. soleus. At the same time no influence of gravitational unloading was found on titin's N2A-izoform in m. extensor digitorum longus. Titin reduction in m. soleus and not in m. extensor digitorum longus can suggest different mechanisms of adaptation to the gravitational changes.

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Keywords

Gravity unloading, M. extensor digitorum longus, M. soleus, Titin

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